

**THERMAL TRANSFER PRINTER/LABELLER SPECIFICALLY DESIGNED FOR
CASSETTES OR READY-TO-USE PACKAGES**

CROSS-REFERENCE TO RELATED U.S. APPLICATIONS

Not applicable.

**STATEMENT REGARDING FEDERALLY SPONSORED
RESEARCH OR DEVELOPMENT**

Not applicable.

NAMES OF PARTIES TO A JOINT RESEARCH AGREEMENT

Not applicable.

REFERENCE TO AN APPENDIX SUBMITTED ON COMPACT DISC

Not applicable.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present industrial invention relates to an automatic machine for printing holograms, marks, barcodes, and variable data on labels and films. The printing operation is performed with thermal technology, using heat-sensitive paper or thermal transfer ribbons. The thermal transfer ribbon, e.g. "carbon ribbon", and the labels or film medium are supplied to the machine in part or completely from special cassette-type containers or ready-to-use packages for which the printer is specifically designed.

**2. Description of Related Art Including Information Disclosed Under 37 CFR 1.97 and
37 CFR 1.98.**

[0002] With specific reference to the thermal transfer printers available on the market today, it is noted that in order to start the machine, the operator must manually apply a spool of thermal transfer

ribbon on the spindle of the apparatus, unwind a length of ribbon, routing it through diverter rollers and across the printhead, and connect and secure it to the take-up core. An equal series of steps is required for label spools, so that the two ribbons will be conveyed together, one overlying the other, between the printhead and drive roller.

BRIEF SUMMARY OF THE INVENTION

[0003] The primary aim of the present invention is to eliminate the obvious drawbacks associated with manual control of operations by devising a semiautomatic or completely automated loading system that can reduce downtime and prevent damage or waste, especially of the printing ribbon, by its nature very thin and susceptible to deterioration.

[0004] These and other aims are achieved by the device conceived according to this invention, which is comprised of a polygon-shaped structure enclosing a cassette-type container of thermal transfer ribbon, a spool or cassette-type container of medium, or a single multiple cassette containing both, a thermal printhead, a series of driving devices, and motorized and idle transmission elements for conveying the ribbons.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0005] These and other features will now become more evident in relation to a simple embodiment of the invention, whose description serves purely illustrative purposes and in no way restricts the scope of this patent.

[0006] Fig.1 provides a perspective view of the invention in the first version comprising only a thermal transfer ribbon contained in a cassette.

[0007] Fig.2 provides a perspective view of the invention in the second version, wherein the cassette containing the heat-sensitive receiving paper is evident.

[0008] Fig.3 provides a perspective view of the invention in the third version, called "double cassette".

[0009] Fig.4 provides a perspective view of the invention in the fourth version, called "multiple cassette", the latter containing both the printing and receiving ribbons.

DETAILED DESCRIPTION OF THE INVENTION

[0010] With reference to the figures, the present invention includes the structure of the apparatus called a printer 1. The cassette 2, of a shape and size depending on the types of ribbon, protects the thermal transfer printing ribbon 3 from contact with the operator, preventing the ribbon 3 from being accidentally unwound during handling and conveyance and being easily inserted in the printer 1, using the fixed references of the latter as guides. The take-up core 4 inside the cassette is necessary to rewind the used ribbon. The external driving device 5 rotates the take-up cores, 6 and 6' in the rest position, indicating a device specific to the printer 1 to extract the ribbon from the cassette and feeds the ribbon 3 out, bringing the ribbon 3 into contact with printhead 7 incorporated in the device itself. The heat-sensitive paper serves as the printing medium 9, 9', which is spooled on friction spindle 10, 11, indicating a series of guiding idle rollers and 8 a rubber-coated drive roller. The printing medium 9 is picked up by motorized rollers 12 and rewound around friction spindle 13.

[0011] The cassette 14, of a shape and size depending on the types of ribbon, contains a spool of the thermal printing medium 9' and the take-up core 13, which will be engaged with the two driving devices 10 serving as guides.

[0012] The multiple cassette-type container 15, having a composite form, contains the spool of ribbon 3 and take-up core 4 as well as the spool of the printing medium 9 and take-up core 13, which will be engaged with the two driving devices 5 and 10 serving as guides.

[0013] In practice, the details of execution, dimensions, materials, shape and so forth of the invention may vary without departing from the scope of the present industrial patent. In fact, the invention thus conceived lends itself to numerous adaptations and embodiments, all of which fall within the framework of the inventive concept. Moreover, all of the elements may be replaced by other technically equivalent ones.